

BOOK REVIEWS

Aquatic Plants

Aquatic Plants of the United States. By Walter Conrad Muenscher. x + 374 pp. 154 figs., 400 maps. Ithaca, N. Y. Comstock Publishing Company. 1944. \$5.00.

This is a compact and, in general, splendid manual of the herbaceous aquatic plants known to occur in the United States, based on many years of research by the author. Submersed and emersed species of fresh, brackish, and salt waters are included, as well as quite a few borderline species of bogs and salt marshes. Woody plants, however, such as *Cephalanthus*, *Taxodium*, *Salix*, *Rhizophora*, *Nyssa*, etc., are not treated.

Dr. Muenscher is professor of botany at the New York State College of Agriculture, Cornell University, and the book is volume 4 of the "Handbooks of American Natural History" series, edited by Albert Hazen Wright. Previously published volumes in the series treat the frogs and toads (vol. I), the mammals (II), and the salamanders (III). A second edition of the volume on mosquitoes (V) is now in press, and volumes on the lizards, snakes, fishes, and turtles are in preparation.

The format of the present volume is excellent; its size is such as to render it a very handy book to carry along in one's pocket on a field trip. It contains, first, a general introduction consisting of a brief account of the distribution of aquatic plants, their reproduction, vegetative propagation, fruit and seed production, the kinds and weights of seeds, and methods of storage and germination of seeds. Then follows a key to the families of aquatic plants enabling the student to refer a plant to its proper family. A key to genera is also provided for every family in which more than one genus is treated. There is a short generic description and a key to all the treated species in each genus, if more than one in number. Habitat and range are stated for each species and geographic distribution by states is shown by a series of 400 outline maps of the United States. These distributional maps comprise one of the most valuable features of the book. The large black dots placed in the outline of each state from which the author has records of the species in question, show the reader at a glance its general distribution and enable him to know where to search for it.

Naturally these maps are not always entirely accurate, but this is due mostly to the deplorable fact that not nearly enough collecting has yet been done in most of our states. Also, many records as published in local lists are often based on misidentifications and authors of books like the one under review

cannot be expected to check every one; indeed, many can never be checked because the actual specimens on which they were based are not preserved! Painstakingly assembled state floras are urgently needed for each state in the Union. Such state floras should contain an outline map of the state for each species and variety discussed and should show the distribution of that plant within the state by counties—as Deam's monumental "Flora of Indiana" (1940) and Gates' "Flora of Kansas" (1940) do. Only after such an exhaustive flora has been published for each state will workers on special groups of plants be able to make accurate distributional maps for the country as a whole. Compilers of such state floras—and the compilation of parts of such a state flora could easily be made the subject of masters' and even doctorate theses in state universities—should not only do extensive collecting in every county of the state, but should have the benefit of published lists of the collections of other botanists in that state, each such list having every record backed by an actual specimen preserved in a readily accessible herbarium where it will be available for checking by the compiler.

Nearly all the species in Muenscher's book are illustrated by excellent line drawings and there are many supplementary illustrations depicting differences in leaf-venation of species apt to be confused with one another, enlargements of fruits, etc. A unique feature of the book is the illustration of the seedlings of almost every species. This is a splendid innovation and entirely in line with the growing tendency among field botanists to learn to recognize members of the flora in stages of growth other than the flowering and fruiting condition. Herbarium and museum workers soon learn that a vast proportion of the specimens brought or sent in to them for identification by amateurs, ecologists, plant pathologists, anthropologists, and travellers, are "sterile," *i.e.*, do not bear the characteristic flowers and fruits. Botanists therefore have to learn to recognize species by their vegetative characters—sometimes even by their roots, in their dried or shriveled-up winter condition, or from miserably small fragments. Herbaria ought to preserve representative specimens of each species at every stage of its growth in order to assist workers in identifying such "sterile" material. Muenscher's study of the seedlings of all the plants discussed is an admirable step in this direction. More such studies are needed and more specimens of the various species in this and the various other pre- and post-flowering conditions are needed in herbaria!

Notes, based upon field observations, are given by Muenscher on the variability, special habitat requirements, special uses, and other features of many species. Differences in interpretation of various genera and species by different botanists are occasionally given. It is to be regretted that they are not given more uniformly. Common names are recorded for some, but not by any means

for all, of the species. Synonyms used by authors of other widely-used manuals are given in some cases. That they are not given in all cases is, in the opinion of this reviewer, one of the major defects of the book. Users of this manual will want to know not only what the correct name of each species is in the opinion of the writer, but also under what names the species may be found in other popular manuals such as Gray's "New Manual of Botany," Britton & Brown's "Illustrated Flora," Small's "Manual of the Southeastern Flora," Rydberg's "Flora of the Prairies and Plains," Deam's "Flora of Indiana," Marie-Victorin's "Flore Laurentienne," Lundell's "Flora of Texas," Jepson's "Flora of California," Hitchcock's "Manual of the Grasses of the United States," Abrams' "Illustrated Flora of the Pacific States," and such standard reference works as "Standardized Plant Names," "North American Flora," and Bailey's "Encyclopedia of Horticulture."

Generic synonyms are, indeed, given in some instances (*e.g.*, *Justicia*, *Nuphar*, *Nymphaea*, *Suaeda*), but there seems to be no mention in the entire book of the generic names *Aranella*, *Biovularia*, *Bruneria*, *Calpidisca*, *Comarum*, *Lecticula*, *Neobeckia*, *Persicaria*, *Philotria*, *Piaropus*, *Setiscapella*, *Stomoisia*, *Tillaeastrum*, and *Vesciculina*—to mention only a few—which are accepted in one or more of the above-mentioned recognized manuals. It is astonishing to find no synonyms whatever given for the water-cress—a species which has a different scientific name in almost every manual one consults due to the exceptionally complicated nomenclatural tangles connected with that group of mustards! Although *Potamogeton heterophyllus* is a name adopted by Gray, Britton & Brown, Small, and Rydberg, it is not mentioned even in synonymy by Muenscher, nor is the name given under which Deam recognizes the plant.

The present reviewer can find no mention in the book, in synonymy or otherwise, of *Potamogeton floridanus*, *P. curtissii*, *Naias gracilis*, *Alisma subcordatum*, *Helanthium parvulum*, *Sagittaria stagnorum*, *S. lorata*, *S. filiformis*, *S. isoetiformis*, *S. cycloptera*, *S. mohrii*, *S. chapmanii*, *S. angustifolia*, *S. macrocarpa*, *S. pubescens*, *S. ornithorhyncha*, *S. viscosa*, *S. australis*, *Philotria linearis*, *Aranella fimbriata*, *Calpidisca standleyae*, *Utricularia pumila*, *U. macrorrhiza*, *U. floridana*, *U. foliosa*, *Lemna trinervis*, *Xyris stricta*, *X. torta*, *X. communis*, *X. elata*, *X. scabrifolia*, *X. difformis*, *X. serotina*, *X. ellioti*, *X. pallescens*, *X. baldwiniana*, *Proserpinaca amblygona*, *P. platycarpa*, *Myriophyllum pinnatum*, *M. laxum*, *Nymphaea ulvacea*, *N. fluviatilis*, *N. chartacea*, *N. macrophylla*, *N. orbiculata*, *N. bombycina*, *Castalia minor*, *C. lekophylla*, *Eriocaulon lineare*, *E. körnickianum*, *E. texense*, and *Thalia geniculata*, to mention only a few of the species accepted in widely used manuals today. Does

the author regard all these as unworthy of specific rank? If so, to what species does he reduce them? The users of this book are certainly entitled to know.

The geographic ranges given are not always too accurate. For instance, *Castalia elegans* is recorded by Muenscher as occurring only in southern Texas. Actually, it is found also in the Big Cypress country of Florida, as Dr. Small has recorded in his Manual (p. 543) and elsewhere. Also, the reviewer wonders why the genera *Lachnocaulon* (with 8 species in the United States) and *Syngonanthus* (1 species) were omitted. They seem to be as worthy of inclusion as some of the species of *Eriocaulon* which are not truly aquatic. Natives of those states will be surprised that *Eriocaulon septangulare* is not recorded from Maine (where it occurs in at least six counties), Delaware, or Maryland (where it occurs in at least three counties). *E. compressum*, also, is known from Maryland and Louisiana and *E. parkeri* from eastern Pennsylvania.

Short bibliographies of the most pertinent literature are given at the close of most of the family treatments, but a general bibliography at the end of the book would have been helpful. Curiously, there seems to be no mention anywhere in the book of the very similar handbook published by Dr. Fassett in 1940.¹

Readers will be fascinated by the figures which Dr. Muenscher gives concerning seed weights. For instance, the "seeds" of *Trapa natans* are about one million times as heavy as those of *Stomoisia cornuta*, of which it requires 175 million to make a pound! Aquatic grass seeds vary from 15,000 to 2,000,000 per pound; sedges from 80,000 to one million; *Xyris* from 35 to 50 million! The widespread occurrence of vegetative reproduction among aquatics and the various means of effecting this, are also admirably presented.

H. N. MOLDENKE

THE NEW YORK BOTANICAL GARDEN
NEW YORK

¹ Fassett, Norman C. A manual of aquatic plants. 382 pp. McGraw Hill Book Co. 1940

Flora of Illinois

Flora of Illinois. By George Neville Jones. The American Midland Naturalist Monograph No. 2, edited by Theodor Just. vii + 318 pp. 2 maps. Notre Dame, Indiana: University of Notre Dame. 1945. \$4.00.

Up to the time of the publication of this work, no comprehensive treatment of the flora of Illinois had ever been published. As Dr. Blake has recently pointed out,¹ there are only 14 of our states that have a published flora "considered to represent in a fairly adequate and detailed way the present state of